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If post-Afghanistan expeditionary forensic capabilities are not sustained or expanded beyond C-IED missions, intelligence support to regional and homeland security will be severely impeded, and the ability to prosecute terrorists, insurgents, or trans-national criminals will be procedurally compromised. As the Department of Defense enters an era of reduced funding and minimal force presence in high-threat areas, increasing joint interagency employment of forensic-enabled intelligence with partner nations will enhance national intelligence and theater security while collectively working towards mutually beneficial defense goals. Therefore, detailed planning for sustained operational employment of expeditionary forensics during Phase 0 shaping operations is currently warranted to support national and regional security strategies.

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MASTER OF MILITARY STUDIES

TITLE:

Expeditionary Forensic Support to Joint Force Commanders: What changes or considerations are warranted?

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENT FOR THE DEGREE OF
MASTER OF MILITARY STUDIES

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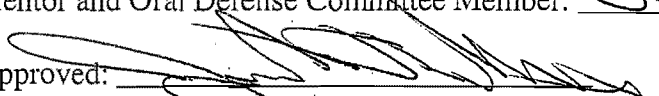
Approved: 

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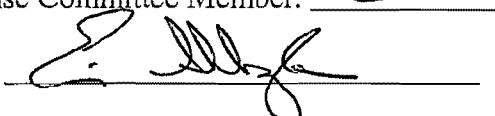
Approved: 

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PREFACE

The purpose of this report is to provide insights to the establishment and employment of expeditionary Forensic-Enabled Intelligence (FEI) in Iraq, and recommend measures to integrate expeditionary forensic capabilities across a broader range of military operations for enduring support to national and regional security efforts.

Joint Publication 2-01 defines FEI as the collection, scientific analysis, and exploitation of materials, weapons, equipment, output signals, or debris that link persons, places, and events to produce tactical and strategic intelligence in support of the Joint Force Commander and national decision makers. FEI includes, but is not limited to analysis of recorded and latent fingerprints, deoxyribonucleic acid (DNA), chemistry trace material, metallurgy, firearms and tool marks, facial and voice recognition, image and video analysis, and captured documents exploitation.

Although Department of Defense (DoD) FEI capabilities are unclassified, detailed operational vignettes are normally restricted For Official Use Only or classified confidential and higher, and therefore are not included in this unclassified report unless obtained from an open source.

Thanks and appreciation for assistance and technical consultation are gratefully extended to CDR Robert Porter and Brian Kelly at the U.S. Navy Explosive Ordnance Disposal Technology Division (NEODTD), Matthew Anderson at the FBI Terrorist Explosive Device Analytic Center (TEDAC), John Manson at the U.S. Army Office of the Provost Marshal General (OPMG), Christopher Dash at the U.S. Army Criminal Investigation Laboratory (USACIL), and Marc Tranchmontagne at R3 Strategic Support Group.

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ACRONYMS

AFIS	**Automated Fingerprint Identification System**
AtN	**Attack the Network**
BEI	**Biometric-Enabled Intelligence**
BJS	**Bureau of Justice Statistics**
CCDR	**Combatant Commander**
CED	**Criminal Evidence Directorate**
CEXC	**Combined Explosives Exploitation Cell**
C-IED	**Counter-Improvised Explosive Device**
DFE	**Department of Defense Forensic Enterprise**
DIA	**Defense Intelligence Agency**
DNA	**Deoxyribonucleic acid**
DoD	**Department of Defense**
EFL	**Expeditionary Forensic Laboratory**
EOD	**Explosive Ordnance Disposal**
FBI	**Federal Bureau of Investigation**
FEI	**Forensic-Enabled Intelligence**
HUMINT	**Human Intelligence**
IC	**Intelligence Community**
IED	**Improvised Explosive Device**
INTERPOL	**International Criminal Police Organization**
IW	**Irregular Warfare**
JCMEC	**Joint Captured Materiel Exploitation Center**
JEFF	**Joint Expeditionary Forensic Facility**
JIEDDO	**Joint IED Defeat Organization**
JPEC	**Joint Prosecution and Exploitation Center**
JSOTF-P	**Joint Special Operations Task Force-Phillipines**
MOD	**Ministry of Defense**
MOI	**Ministry of Interior**
NATO	**North Atlantic Treaty Organization**
NEODTD	**Naval EOD Technology Division**
NGIC	**National Ground Intelligence Center**
NRCNA	**National Research Council of the National Academies**
OPMG	**U.S. Army Office of the Provost Marshal General**
SIGINT	**Signals Intelligence**
SJA	**Staff Judge Advocate**
SOF	**Special Operations Forces**
TECHINT	**Technical Intelligence**
TEDAC	**Terrorist Explosive Device Analytic Center**
USACIL	**U.S. Army Criminal Investigation Laboratory**
USSOCOM	**U.S. Special Operations Command**

EXECUTIVE SUMMARY

Title: Expeditionary Forensic Support to Joint Force Commanders: What changes or considerations are warranted?

Author: LCDR Oliver R. Herion, USN

Thesis: Expeditionary forensics has been a critical enabler to Improvised Explosive Device (IED) Network Defeat operations in Iraq. As operations end in Afghanistan, expeditionary forensics should be applied to a broader range of Irregular Warfare (IW) missions to support national security and defense strategies more effectively.

Discussion: Since the summer of 2003, expeditionary forensics has evolved from an ad-hoc working group in Iraq to direct support to a 2008 National Security Directive and 2011 Department of Defense Enterprise.[1] In 2010 alone, expeditionary forensics enabled the capture of over 700 high-value individuals associated with IED events, and 118 denials of U.S. immigration benefits to personnel associated with suspected terrorist or criminal activity.[2] Hundreds of classified Forensic-Enabled Intelligence (FEI) findings were critical to Counter-IED (C-IED) and Force Protection efforts.[3] Unclassified biometric matches to IED conspirators were equally vital to the prosecution of individuals and defeat of organized networks, enhancing security to coalition forces and safety to local populace, and establishing legitimacy of host-nation judiciary.

As the U.S. shifts from leading offensive operations in Iraq and Afghanistan to supporting regional shaping operations through, by, and with partner nations, Joint Force Commanders should continue to identify and engage terrorist and criminal enterprises with FEI-enabled Attack the Network (AtN) strategies developed in Iraq and refined in Afghanistan. This paper examines the recent successful history of expeditionary FEI support to stability operations in Iraq, and from those observations proposes a 3-Priority plan of Partnerships, Expeditionary Collection and Analysis, and Dedicated Support to Rule of Law to transition expeditionary forensics effectively to shaping operations.

Conclusion: If post-Afghanistan expeditionary forensic capabilities are not sustained or expanded beyond C-IED missions, intelligence support to regional and homeland security missions will be severely impeded, and the ability to prosecute terrorists, insurgents, or trans-national criminals will be procedurally compromised.

As the Department of Defense (DoD) enters an era of reduced funding and minimal force presence in high-threat areas, increasing joint interagency FEI employment with partner nations will enhance national intelligence and theater security while collectively working towards mutually beneficial defense goals. Therefore, detailed planning for sustained operational employment of tactical FEI during Phase 0 shaping operations beyond C-IED is currently warranted to support national and regional security strategies.

"*DoD must institutionalize and enhance our capabilities to fight the wars we are in today and the scenarios we are most likely to face in the years ahead.*"
Secretary of Defense Robert M. Gates, 6 Apr 09[4]

Introduction:

Expeditionary forensic intelligence enabled coalition forces in Iraq to assess and counter the enemy's IED capability, and biometrically distinguish friend from foe in order to compromise network effectiveness and neutralize key personnel to provide security and stability to the operating environment. The forensic capabilities developed in Iraq and refined over the past decade are equally applicable and effective to IW threats beyond C-IED, but operational planners and resource providers must innovate and overcome challenges imposed by the shift from U.S.-led operations in Iraq and Afghanistan to U.S.-supported shaping operations through, by, and with regional partners. Future military missions will be executed with a smaller force operating alongside or in support of host-nation counterparts, and detailed planning is warranted to employ forensic assets to counter regional and global threats effectively from non-state adversaries.

The Capstone Concept for Joint Operations identifies three most likely national security threats for planning consideration through 2025, and two of the broad threats encompass nontraditional networks rather than conventional military organizations.[5] These non-state adversaries will be difficult to identify and distinguish from local populations, and will employ asymmetric tactics without regard for customary law of war to achieve political, economic, or social power. Combatant Commanders (CCDRs) and Joint Force Commanders will likely employ Attack the Network (AtN) strategies developed in Iraq and refined in Afghanistan to find, fix, and finish (capture or kill) these non-linear threats to regional and national security. Expeditionary forensics is not a silver bullet that will provide a decisive advantage to U.S. forces, but it is a recognized

tradecraft employable by police and military forces to enable IW efforts against violent extremist networks.

This report provides a historical context to highlight how expeditionary forensics evolved and succeeded in Iraq, and proposes a 3-Priority plan of Partnerships, Expeditionary Collection and Analysis, and Direct Support to Rule of Law to posture expeditionary forensic enablers for enduring support to joint forces conducting IW missions beyond C-IED. Operational FEI effects are entirely dependent on initial collection and time-critical analysis, and missed opportunities will jeopardize near and long-term exploitation efforts. If expeditionary forensic capabilities are not sustained or expanded beyond C-IED missions, intelligence support to homeland and regional security will be severely impeded, and the ability to prosecute terrorist, insurgents, or trans-national criminals will be compromised.

"*The real intelligence hero is Sherlock Holmes, not James Bond.*"
Lieutenant General Samuel V. Wilson, 5th Director of the DIA, 1976-1977[6]

History

Evidence technicians and forensic science examiners are most commonly associated with civilian law enforcement investigating criminal activity. In real life and on many popular television series a crime or attack happens, forensic investigators deploy to find and collect evidence, then laboratory analysts scientifically determine *who did it*, and prosecutors ultimately use those forensic findings to obtain apprehension warrants and pursue judicial convictions. While that sequence of events does not usually play out in real life as cleanly and quickly as television would have us believe, forensic biometric science has revolutionized the way detectives solve crimes and prosecutors seek convictions and has recently evolved into military intelligence and rule of law operations.

Prior to September 2001, the DoD primarily utilized forensics within limited criminal investigations and identification of human remains.[7] DoD had neither the vision nor capability to conduct theater-wide collection and expeditionary analysis of forensic biometrics to enable operations. Instead, the Defense Intelligence Agency (DIA) deployed adaptable Technical Intelligence (TECHINT) capabilities within Joint Captured Materiel Exploitation Centers (JCMECs) to quickly analyze captured enemy equipment in support of conventional operations. JCMECs would conduct in-theater exploitation to derive intelligence from collected foreign military equipment and materiel to assess adversary technical capabilities and develop countermeasures if necessary to neutralize advantages.[8] While enduring JCMEC needs and requirements still exist, asymmetric threats emanating from Iraq in 2003 identified the need for novel solutions to meet new security challenges.

During the early months of Operation Iraqi Freedom, the Navy, Army, and Marine Corps all sensed the need for an expeditionary forensic capability to enable intelligence operations and later support rule of law efforts. Due to the lack of capabilities to support the new requirements, all three services developed separate initiatives, beginning with the in-theater establishment of a Combined Explosives Exploitation Cell (CEXC) to assess and mitigate threats from mass-produced IEDs.

Navy CEXC - Iraq

The volume and complexity of IED threats faced by coalition forces in Iraq in the summer of 2003 was beyond the conventional skill-set of a JCMEC to analyze effectively for actionable intelligence. Despite conventional victory over Iraqi forces in May 2003, 279 IED attacks were carried out in a 30-day period between 15 July and 15 August in

Baghdad and the northern areas of operations as an insurgency emerged within a leadership vacuum created by the fall of the Hussein regime and Baath political party.[9] A small group of technical operators and intelligence analysts sensed that IEDs were evolving from a tactical threat to a strategic weapon of influence. Even fewer foresaw that the volume of IEDs could become an intelligence opportunity yielding important information about the enemies' capabilities and provide forensic clues to identify insurgents and networks.

U.S. forces in Iraq, organized as Combined Joint Task Force 7 (CJTF-7), needed an urgent, in-extremis solution to address the coordinated IED campaign against coalition forces and local populace. Spurred by the consistent threat of lethal IEDs and absence of coordinated joint expertise or doctrinal capability, interagency intelligence and Explosive Ordnance Disposal (EOD) specialists collaborated to develop an operationally viable solution to the emerging strategic threat. One of the visionary problem solvers and linkage connectors was a U.S. Navy EOD officer operating in Iraq with a Combined Joint Special Operations Task Force (CJSOTF).[10] Over the course of several missions in Baghdad, he noticed a discernable pattern of recognizable IED hardware components and emplacement tactics. After sharing tactical information with in-theater professionals for collective analysis and threat awareness, he also shared operational concerns with United States Special Operations Command, Central Command, the U.S. Naval EOD Technology Division (NEODTD), and the newly formed Joint Intelligence Task Force Counter-Terrorism Weapons Branch at DIA.[11] Concurrently, he also discovered an ad-hoc group of American and British specialists working in the CJTF-7 JCMEC to address the emerging IED problem by employing British corporate knowledge gained from

decades of C-IED campaign experience in Northern Ireland. The group gathered post-blast evidence from as many Baghdad IED events as possible to conduct forensic examinations focused on technical design, emplacement, and initiation. Following analysis, they produced after-action reports within days containing tactical warnings and recommendations for EOD personnel operating in-theater or conducting pre-deployment training.[12]

Over the course of several weeks, coordinated and focused by the CJSOTF EOD officer, the working group developed a broader intelligence picture from the exploited evidence. They confirmed through rudimentary forensic findings and subsequent apprehension interrogations that much of the IED activity occurring in Baghdad in the summer and fall of 2003 was connected to a developing insurgency led by Abu Musab al-Zarqawi employing remnants of the Al Ghafiqi project from Iraq's former Mukbarat intelligence organization.[13]

That initial operational success prompted CJTF-7 to request DIA and the United Kingdom Defense Intelligence Staff to establish and resource a multi-national interagency CEXC to provide timely analysis of significant IED incidents occurring in the Iraqi Theater of Operations.[14] Although the initial establishment memorandum recommended cell composition of approximately eight personnel, increased enemy activity resulted in corresponding personnel and capability increases over months and years commensurate to the level of IED exploitation opportunities. Ultimately an Individual Augmentee Joint Manning Document was established consisting of approximately fifty technical, intelligence, and support specialists sourced from U.S. joint forces, coalition, and interagency partners to include the United Kingdom, Australia,

DIA, Federal Bureau of Investigation (FBI), Bureau of Alcohol, Tobacco, and Firearms, and National Ground Intelligence Center (NGIC).[15]

CEXC was originally established to conduct technical (electrical/mechanical) exploitation of recovered evidence and provide tactical analysis of IED events, but assigned FBI Special Agent Bomb Technicians (SABT) encouraged Task Force leadership in 2005 to expand biometric capabilities to exploit latent fingerprints from the massive volume of recovered evidence.[16] Up to that point, military staffs were largely unaware of the operational potential for biometric evidence. Support for this theory can be found within CJTF-7 Interrogation and Counter-Resistance Policy guidance issued in September 2003. This guidance was modeled on the Guantanamo Bay interrogation policy modified for a theater of war in which the Geneva Conventions apply, and did not mention utilization of biometric linkages (either confirmed or deceptive) to solicit confessions or intelligence from detainees. Instead, the guidance included traditional military techniques of fear, dietary and environmental manipulation, stress positions, sleep management, and presence of military working dogs.[17]

To identify the enemy biometrically as recommended by CEXC FBI SABTs and endorsed by military leadership, the NGIC in Charlottesville, Virginia, sourced contractors to conduct analysis of latent fingerprints found on IED-related evidence. Subsequent production of time-sensitive actionable intelligence exceeded all expectations. Biometric findings from expeditious in-theater analysis were usually completed within 24 hours of evidence arrival to the laboratory, and later synchronized at NGIC headquarters to the national Biometric Data Center for comparison to known individuals and historical archiving. Following in-theater analysis, evidence was also

forwarded to the FBI Terrorist Explosive Device Analytic Laboratory (TEDAC) in Quantico, Virginia. By January 2012, TEDAC had received approximately 50,000 boxes of IED-related evidence from Iraq for further detailed examination and long-term storage for potential future prosecutions.[18]

On average, CEXC forensic specialists discovered hundreds of latent prints per month resulting in scores of biometric matches to known individuals that had been previously enrolled in Iraqi or U.S. biometric databases.[19] In 2008 at the request of Law Enforcement Professionals and staff judge advocate (SJA) attorneys embedded with operational forces, CEXC began producing unclassified Apprehension and Detention Warrants translated into Arabic for Iraqi judges to consider while adjudicating criminal cases resulting from Biometric-Enabled Intelligence (BEI).[20] CEXC forensic specialists routinely testified to Iraqi judges at the Central Criminal Court in the Karkh district of Baghdad to clarify how biometrics were detected on evidence and matched to the suspect.[21] Latent prints found but not matched to an individual were added to DoD and DoJ databases for periodic automated comparison to future enrollments, including applications for U.S. visas or border entry through checkpoints. CEXC BEI was also integrated into the all-source intelligence analysis process, identifying individual patterns and broader relationships to associated networks and geographic locations. With a high degree of confidence based on peer-reviewed exploitation, intelligence analysts supporting both SOF and conventional forces were able to identify active participants in IED events, to the degree that low-level IED emplacers could be distinguished from highly-skilled IED builders. Human Intelligence (HUMINT) and Signals Intelligence (SIGINT) could then also be prioritized and employed accordingly for optimal

effectiveness. The synchronization of BEI with HUMINT and SIGINT developed a comprehensive operational picture of organized IED cells and networks, with associated threads to leaders, lieutenants, suppliers, technical experts, and emplacers.

By December 2011, CEXC Iraq processed over 42,000 cases ranging in complexity from a single strand of tape recovered from a post-blast scene to over 10,000 items recovered from one IED cell cache, physically enabling several hundred thousand *contacts with the enemy* to determine technical capability and biometric identity through forensic analysis.[22] NEODTD in Indian Head, Maryland, maintains the Navy's enduring expeditionary CEXC capability to provide specialized C-IED electrical engineering skills for technical exploitation of high-end electronic IED circuitry, and specialized EOD skills for sensitive site exploitation and evidence collection in support of operations where IEDs, explosive precursors, or device components are expected. While CEXC provided direct support to C-IED efforts, additional capacity was also required for traditional criminal forensics to process evidence from non-IED extra-judicial killings.

Army Joint Expeditionary Forensic Facility (JEFF)

The U.S. Army Criminal Investigative Division (CID) established a Joint Expeditionary Forensic Facility (JEFF) in December 2006 at Camp Victory in Baghdad to examine evidence from sniper attacks occurring throughout Iraqi. Initial forensic findings were so effective that the Multi-national Corps Iraq (MNC-I) Commanding General directed establishment of JEFF labs in all three major divisions of operation to support more than twenty brigade combat teams and various CJSOTF elements working with local security forces.[23]

Once JEFF laboratories were co-located with operational forces, their mission quickly expanded to include exploitation of non-IED evidence recovered from torture houses, terrorist caches, highly sensitive political cases, and DNA identity confirmation of high-value individuals killed in action or recovered human remains suspected to be kidnapped coalition personnel.[24] JEFF also supported co-located CEXC labs with DNA and specialized metallurgy analysis. Based in part on observations and lessons from Iraq, the Department of the Army in March 2009 issued a Concept of Operations to doctrinalize how forensic evidence supports Police Intelligence Operations, and the U.S. Army Criminal Investigative Laboratory (USACIL) maintains enduring expeditionary forensic capabilities to support contingency, operational, and theater engagement strategies as required.[25] While CEXC and JEFF supported operations throughout Multi-National Divisions South, Central and North, U.S. Marines operating in the Al Anbar province in 2006 had similar security and intelligence challenges but operated without the benefit of organic forensic support.

Marine Corps Joint Prosecution and Exploitation Center (JPEC)

An intelligence and security challenge for Marines serving in Multi-National Force West (MNF-W) was the inability to track detainees through lengthy detention processes and ultimately assist SJA prosecutors with evidentiary justification for continued detention or prosecution in Iraqi courts. Regiments, brigades, and subordinate units had neither the expertise nor manpower to develop detainee case files to document charges and supporting evidence, and many of the detainees had been captured months earlier by units no longer in-theater.[26]

Originally developed to serve as a quasi-probation board, the JPEC quickly

expanded to support tactical site exploitation, forensic examination, and training to enable all-source intelligence targeting and rule of law (apprehension, detention, and prosecution). JPEC participants included Marine Corps intelligence, Criminal Investigation Division, Navy Criminal Investigative Service, contract law enforcement professionals and JEFF support. A headquarters element was co-located in the MNF-W G2, and operational JPECs were co-located with regimental combat teams at Fallujah and Al Asad to synchronize support to command and tactical forces.[27]

JPEC activities included investigation of over 500 criminal cases in an eight month period, and positive biometric identification of over 140 suspects with linkages to criminal incidents. JPEC also trained more than 2000 coalition forces in tactical site exploitation, and over 70 Iraqi police investigators in crime scene investigation and case management techniques.[28] Based on JPEC success and lessons-learned, the Marine Corps doctrinalized the JPEC concept and capability within a *Forensic Enterprise Strategy* published in April 2010, and a more comprehensive *Identity Operations Strategy 2020* published in April 2011 to support IW operations beyond Afghanistan.[29]

"*Whenever possible, we will develop innovative, low-cost, and small-footprint approaches to achieve our security objectives. Accordingly, U.S. forces will retain and continue to refine the lessons learned, expertise, and specialized capabilities that have been developed over the past ten years of counterinsurgency and stability operations in Iraq and Afghanistan.*"
Sustaining U.S. Global Leadership: Priorities for 21st Century Defense. January 2012.[30]

Way Ahead:

The Secretary of Defense, in April 2011, designated the Secretary of the Army as Executive Agent for all forensics, with the exception of Air Force responsibility for digital and multimedia forensics, and DIA responsibility for forensic intelligence activities and programs.[31] The Army is also currently aligning functional oversight of Forensics, Biometrics, Law Enforcement, Detainee Operations, and Physical Security

under one overarching program known as *Identity Operations* in order to more efficiently synchronize overlapping and complementary efforts.[32] Although the DoD Forensic Enterprise (DFE) assigns responsibilities and actions across the force and down to CCDRs, it implies but does not specify application of FEI to IW missions beyond Counter-IED. Beyond specific guidance to DIA and the Joint IED Defeat Organization to establish forensic standards and procedures in support of Weapons Technical Intelligence (WTI) efforts, no additional direction is issued to support IW or joint interagency efforts to combat trans-national organized crime. Rather, the Joint Chiefs direct CCDRs to coordinate forensic requirements to support and facilitate national military objectives across the range of military operations.[33]

By 2010, DoD had deployed seven forensic laboratories to Iraq and eight to Afghanistan to support Joint and North Atlantic Treaty Operations (NATO) operations.[34] As CEXC and JEFF capacity off-ramped in Iraq and in many cases surged to Afghanistan, USACIL renamed the JEFF to Expeditionary Forensic Laboratory (EFL).[35] Unity of effort was also initiated in Afghanistan by combining CEXC capabilities within an EFL, in lieu of maintaining two separate stand-alone facilities. This cooperative effort began ad-hoc in 2008 at Camp Victory and COB Speicher in Iraq, but was formalized and completed in Afghanistan.[36] The importance of combining and retaining CEXC EOD capabilities within an EFL is underscored by severe injuries suffered by laboratory personnel on two occasions in 2009 and 2010 while handling sensitive home-made explosives in Afghanistan, and the complete destruction of the CEXC Iraq Triage laboratory onboard Camp Victory in September 2009 from a fire and subsequent detonations from explosive evidence awaiting exploitation.[37] Even in non-IED

environments, it is prudent to retain EOD skill-sets within the Triage section of the laboratory to sort and screen incoming material for explosive, chemical, biological, or radiological hazards before the evidence proceeds to the science sections for examination and exploitation.

As the U.S. shifts from leading offensive operations in Iraq and Afghanistan to supporting regional shaping operations by, with, and through host-nation partners, plans for future expeditionary forensic support should prioritize three complementary efforts of partnerships, expeditionary collection and analysis, and dedicated support to rule of law. Partnerships will be critical for U.S. access to sovereign areas and interoperability with host-nation tactical forces. Expeditionary collection and analysis will be critical to provide timely feedback to all-source intelligence and host partners on evidence recovered and exploited, further demonstrating the value of forensics and biometrics to host-nation decision-makers for continued support and cooperation. Dedicated support to rule of law will enable national and regional security through apprehension and prosecution of high-value suspects, and bolster the cyclical relationship between conversions of intelligence to warrant-based targeting for apprehension and interrogation to generate new intelligence leads. Together, these three prioritized and nested efforts can optimally posture expeditionary forensic capabilities for enduring support to national and regional security objectives.

Priority 1- Partnerships

After Iraq and Afghanistan, permissive environments to collect and exploit evidence unilaterally will cease as the U.S. transitions to Phase 0 shaping operations *by, with, and through* partner nations. Sustained expeditionary forensic and biometric efforts

will have to be conducted through partnerships, as U.S. forces operating on sovereign foreign territory do so with the consent, cooperation, and support of host-nation authorities. To achieve full operational potential, forensic goals and objectives should be coordinated at senior leadership levels to include the Defense Attaché, Office of Defense Cooperation, Regional Security Officer, and Legal Attaché with Ambassador support.

NATO is also embracing BEI and developing doctrine through Standardized Agreement Study 4715 to establish a biometric collection and intelligence reporting protocol.[38] NATO has ranked Biometrics ninth on its Top-50 priority list, and is working with the International Criminal Police Organization (INTERPOL) in the Horn of Africa to identify, capture, and prosecute piracy suspects.[39] With approval from the UN-backed transitional government in Somalia, INTERPOL is planning to collect photographs, fingerprints, and DNA profiles from suspected pirates for comparison to evidence from past crimes, and as a database to compare future offenders.[40] Through these multi-national efforts, potentially even more piracy suspects can be identified and extradited for prosecution in the United States, United Kingdom, Germany, or Seychelles as has already been done in the past several years.

FEI was established in Iraq during U.S.-led operations, but ultimately succeeded during the bi-lateral Security Agreement phase through partnership programs with military and police forces. Prior to the U.S. invasion in 2003, Iraq possessed a nascent police forensic science program organized under the national Criminal Evidence Directorate (CED).[41] In 2000, the CED, with assistance from Russia, established an Automated Fingerprint Identification System (AFIS) to enable a national identity program and support criminal investigations. Although only 1000 fingerprint cards were

loaded into the system between 2000 and 2002, AFIS staff secured and protected the data during the liberation of Baghdad and turned it over to U.S. forces at the end of combat operations. U.S. forensic specialists subsequently upgraded the antiquated AFIS computer system and assisted Ministry of Interior (MOI) staff with entering over 1,200,000 biometric records associated with MOI and Ministry of Defense (MOD) employees, weapon license holders, criminal cases from prior to 2003, and latent prints from recent crime scenes.[42] In 2005, the United Kingdom with assistance and financial support from Australia and the United States initiated a forensic science program known as *Forensic Project – Iraq* to bring national and local police up to internationally recognized standards. The program was ambitiously comprehensive and included both training and establishment of forensic laboratories in key cities. Iraqi training participants were screened for selection by MOI leadership and touted as experts in their respective fields, but were in most cases later assessed by coalition mentors to be novices with skills far below internationally recognized certification standards. Regardless, intermediate training was provided in Iraq, and advanced training was conducted at national laboratories and universities in the United Kingdom, Australia, and Jordan to establish a credible and self-sustaining Iraqi forensic program.[43] C-IED Task Force TROY also hosted a series of 6-week training programs beginning in October 2009 for Iraqi Army and Police EOD technicians to collect IED evidence safely from crime scenes for follow-on examination at the laboratories built and staffed through *Forensic Project-Iraq*.[44] This initiative provided not only tactical skills, but more importantly demonstrated to participants the necessity of *inter-ministry* cooperation.

In late 2009, after more than four years of program management, construction and equipping of laboratories were completed in the cities of Baghdad, Karada, Erbil, and Basrah.[45] Between 2006 and October 2009, the Iraqi AFIS staff with coalition mentorship, biometrically identified 20,000 corrupt police and army officers that were subsequently relieved of duties, and confirmed identification of 200 unknown remains from 1500 missing-person records.[46] Beginning in 2009 when Iraqi Forces assumed security responsibilities within major cities, over half of the IED evidence received by CEXC was turned in by Iraqi partners.[47] Without that level of Iraqi cooperation, corresponding U.S. forensic intelligence assessments and subsequent prosecutions would have been severely degraded.

Iraqi forensic capabilities enabled through the historical training programs are currently utilized to investigate coordinated bomb attacks against Iraqi citizens and security forces, including coordinated bomb attacks in multiple cities between January and March 2012, targeting locals and security forces killing 186 and wounding over 300.[48] Despite the formal end of mission and withdrawal of U.S. combat forces in December 2011, a small contingent of U.S. military and contracted forensic specialists remain in Baghdad at the request of the Iraqi government to assist further forensic program development and advise tactical forces to confront current and future internal security challenges.[49] This on-going effort establishes a model for low-density joint forensic support to assist and advise host-nation security forces monitoring and mitigating enemy resurgence during shaping operations.

Priority 2- Expeditionary Collection and Analysis[50]

Evidence collection and analysis succeeded in Iraq for many reasons, including but not limited to the fact that there was an unprecedented volume of terrorist activity that generated massive amounts of physical evidence for comparison to millions of biometric enrollments of the target population (military-age males, criminals, foreign visitors, etc.). Evidence collection was primarily conducted by specialized Weapons Intelligence Teams, and Special Weapons Exploitation Teams also partnered with Iraqi units to bi-laterally collect evidence for turn-in to CEXC or JEFF labs.[51] USSOCOM currently leads the DoD effort to institutionalize forensic evidence collection into shaping operations, and instructs tactical evidence collection techniques to enable joint SOF operators to identify and preserve evidence for follow-on forensic exploitation.[52] The Bin Laden strike mission is a spectacular example where more time on-target was allocated to the secondary effort to locate and seize intelligence materiel, after the primary objective to kill or capture the high value target was achieved.[53] General-purpose evidence collection training is also available through Army Knowledge Online (Level 1) Evidence Awareness and practical (Level II) Battlefield Evidence Exploitation training through Mobile Training Teams.[54] Specialized enablers such as joint EOD technicians also receive post-blast evidence collection training through qualification pipeline and pre-deployment training cycles, so the capability to collect evidence in an expeditionary environment will endure through the conventional and specialized joint force.

Geographic location of EFLs in relation to collection activities is also vital to complete latent fingerprint and DNA examinations in less than 36 hours for optimal

support to time-sensitive intelligence and targeting efforts. In comparison, a 2002 study by the Bureau of Justice Statistics (BJS) found that the 50 largest crime labs in the U.S. ended the year with over 270,000 backlogged cases, including 51,000 latent print and 31,000 DNA backlogs. The BJS study determined that approximately 400 additional examiners were required to achieve a law-enforcement acceptable 30-day turnaround on requested forensic services, highlighting a key difference between war-fighter and crime-fighter requirements to support respective operational objectives.[55]

Prioritization for deployment of limited expeditionary forensic resources will likely focus on the Near East and South Asia as more than 75% of terrorist attacks and deaths occurred there in 2010. FEI efforts should be focused on areas with active Sunni extremist groups as that demographic in 2010 committed almost 60% of worldwide terrorist attacks, 93% of suicide attacks, and caused approximately 70% of the over 13,000 terrorism-related deaths.[56] Areas with a suspected high recidivist population should also be considered for evidence collection activities. Approximately 10% of the monthly biometric matches made by CEXC Iraq in the second half of 2009 were attributed to recidivists released from detention through amnesty programs or fulfillment of their original sentence, and the Director of National Intelligence confirmed to Congress recently that approximately 28% of detainees (167 of 599) released from the Guantanamo Bay detention facility have been confirmed or are suspected to be re-associated with violent extremist activity.[57]

Organized IED activity is also not restricted to Afghanistan and Iraq. In a 24-month period beginning in March 2009, the Global IED Relational Database documented a monthly average of 299 fatalities and 872 injuries from 296 IED detonations outside of

Afghanistan and Iraq. Additionally, local security forces find a monthly average of 80 caches and 260 IEDs prior to detonation, from which a competent forensic team can yield a trove of intelligence. Statistics from the month of March 2011 when the survey ended included 188 fatalities and 648 injuries from IED detonations, and 274 IED and 55 cache finds.[58] Those monthly numbers alone indicate the presence of organized active cells vice individual rogue actors, and forensic biometric linkages to any individual is a vital clue in the larger effort to disrupt organized violent activity.

Failed states within Africa could also benefit from expeditionary forensic capabilities. Contractors supporting the UN-backed transitional government in Somalia recently found anti-armor IEDs used by foreign fighters training Somalia Islamist militants, confirming for the first time that IEDs of this type and sophistication were present in that region.[59] IED attacks in Nigeria also more than doubled to 196 in 2011, up from 52 in 2010.[60] These increases in IED sophistication and volume indicate logistical support and training from more capable terrorist cells on the continent.[61] Without a regional EFL with CEXC capabilities to partner with local forces and quickly respond to recover and analyze evidence, potential Force Protection and BEI findings critical to regional and homeland security are compromised.

The Joint Special Operations Task Force- Philippines (JSOTF-P) is arguably the most logical model mission for enduring EFL support with CEXC capability. Formally established as Operation Enduring Freedom-Philippines in early 2002, the JSTOF, in coordination with the U.S. Country Team, conducts Foreign Internal Defense with the Republic of the Philippines Security Forces to destroy terrorist groups and neutralize enemy safe havens.[62] Present components critical to a viable sustained FEI program

include an established U.S. Country Team, and host nation military ability to lead the fight against terrorist and insurgent threats.[63] JSOTF-P's indirect approach through close coordination with the U.S. Country Team and cooperation with host nation security forces enable a potential operational environment for targeted biometric enrollments and collection of evidence for forensic analysis. Elements of the 500-person JSOTF that could potentially augment an operational FEI program through, by and with host nation partners include SOF, Civil Affairs, Military Information Support Teams, and EOD. Separate but related, the Government of the Republic of the Philippines has also requested U.S. assistance to digitize 800,000 fingerprint cards for storage in a searchable format, and if the U.S. cannot support, China and Japan have offered to help develop this capability.[64] Currently, two USACIL EFLs are supporting CCDR Identity Operations outside of sustained operations in Afghanistan, and that number will certainly increase in coming years as assets redeploy from Afghanistan and CCDR staffs identify core requirements for scalable forensic science modalities based on current or anticipated threats.[65]

Priority 3- Dedicated support to Rule of Law

CEXC, JEFF, and JPEC all functionally evolved in Iraq to support Rule of Law efforts related to the intelligence generated from respective forensic analysis. The Multi-National Division Baghdad 2009 Command History Report highlights the operational effectiveness and the strategic importance of linking forensic intelligence to Rule of Law to bolster partnerships between U.S. and Iraqi security partners following implementation of the 2009 Security Agreement.[66] Of particular note is the excerpt describing initial

skepticism about warrant-based targeting, and subsequent cooperation from Iraqi police and judges in obtaining necessary documents.[67]

The most important Rule of Law benefit from expeditionary forensics is support to U.S. homeland security, where in 2010 alone, expeditionary BEI enabled 118 denials of U.S. immigration benefits to personnel associated with suspected terrorist or criminal activity.[68] Two recent U.S. prosecution examples include an October 2011 extradition of four Singaporeans to the U.S. to stand trial on violation of export-control law, and a December 2011 conviction by a federal grand jury in Bowling Green, Kentucky, against two Iraqi nationals for federal terrorism charges.

The export-control case involved four Singaporeans indicted and extradited to the U.S. for smuggling 6,000 radio frequency modules through Singapore to Iran in 2007. At least 16 of the devices were purchased from a Minnesota company and subsequently found in Iraq during CEXC examination of unexploded IEDs in 2008-2010. A fifth suspect on the extradition request is an Iranian citizen and resident who remains at large. The Minnesota company that manufactured the electronic devices was not charged, as conversations recorded between the Singaporeans and Iranian end-user confirmed their plot to circumvent export-control measures by duping the U.S. manufacturer.[69]

The Kentucky case involves two Iraqi citizens who were originally apprehended in Bowling Green in May 2011 and indicted on twenty-three counts of federal terrorism charges related to providing materiel support to Al Qaeda in Iraq. During the investigation, one of the two Iraqis was also biometrically linked to IED evidence processed by CEXC from a series of attacks years earlier against U.S. forces in Iraq. The

forensic link from Iraq expanded domestic federal charges to include conspiracy to kill U.S. nationals abroad; sentencing for both defendants will be announced in April 2012.[70]

Utilizing BEI in conjunction with U.S. or host-nation legal proceedings avoids many of the intelligence disclosure considerations associated with HUMINT or SIGINT generated intelligence, as there is nothing classified about the fact that an individual's fingerprints or DNA were found inside evidence recovered from a weapons cache or IED event. Afghan courts have also been increasingly using ISAF-generated BEI to prosecute cases and have almost doubled the length of detention for IED-related activities in comparison to sentences issued prior to consideration of biometric findings.[71]

For EFLs to fully support Rule of Law efforts, SJAs and Department of State Rule of Law specialists should be assigned as required for full-time dedicated EFL liaison to convert BEI into warrant-based apprehensions, interrogations, and prosecutions. Unity of effort concepts such as Prosecution Support Teams proposed by Judge Advocate Major Steve Berlin, combined with EFL efforts, will synchronize the skills and resources necessary to prosecute violent extremists identified through expeditionary forensic biometrics in U.S. or host nation courts.[72]

"The use of BEI has been so successful in current operations that the Army, the DoD, and the intelligence community are looking at how to incorporate it into all military operations. While BEI is widely used in the Central Command area of responsibility, it isn't fully implemented in the other Combatant Commands."[73]
INSCOM Journal, Spring 2008

Challenges and Recommendations

The interpretive nature of biometric comparisons is an enduring challenge that must be carefully managed. Although hand-held biometric enrollment tools normally collect handprints, DNA, and iris scans, interpretive latent print comparisons comprise the vast majority of identity matches. DNA and iris scans are much more objectively

definitive for comparative determinations, but make up a minimum of the biometric matches made in Iraq and Afghanistan.[74]

Due to a historical pattern of substantive information based on faulty forensic analysis and exaggerated expert testimony in U.S. criminal cases, Congress directed the National Research Council of the National Academies (NRCNA) in 2006 to assess the domestic forensic science program and recommend comprehensive improvements to include forensic support to homeland security missions. The subsequent study and report published in 2009 confirmed vast disparities in national capabilities and a lack of mandatory standardization, certification, and accreditation.[75] Expeditionary forensic analysis assumes additional risk through heavy reliance on contracted specialists instead of active duty or government service employees. Currently, active duty occupational specialties do not include analytic forensic qualifications, and the minimal number of government forensic scientists at service laboratories require contracted support to sustain non-deployed operations.[76] NEODTD and USACIL must manage these risks proactively and monitor individual qualifications and laboratory certifications by complying with recommendations and regulations that arose from the NRCNA report.

Awareness by senior leadership and the broader Intelligence Community (IC) of expeditionary forensic capabilities will also remain a challenge. Recent DoD surveys indicate that the IC and joint leadership are largely unaware of the operational advantages that forensics can provide unless they are in the minority of professionals that have had personal positive FEI experiences. Iraq and Afghanistan intelligence veterans rated biometrics as the most important and useful technology supporting AtN targeting processes, while intelligence professionals outside the area of operations rated biometric

value much lower.[77] This point is especially critical since senior military and civilian leaders at Combatant or Component Commands and embassies must negotiate partnership agreements with regional counterparts to enable viable and sustained forensic efforts.

Operational security will also emerge as an enduring challenge as forensic and biometric enabled intelligence proliferate through the media, and military capabilities are exercised in cross-training with regional security partners. Risk will increase that enemies may use knowledge of exploitation capabilities to their advantage by taking active measures to thwart BEI efforts. That risk is minimal and out weighed by operational transparency and professional development of partner forces. In 2009, CEXC Iraq detected IED cells employing rudimentary methods to minimize biometric signatures on recovered evidence, yet tangible forensic evidence was still discovered in most of those cases.[78] In civilian law enforcement, a similar *cat and mouse* game also exists between criminals and law enforcement. Despite countless television shows and movies depicting forensic techniques and capabilities, criminals are rarely able to avoid detection by out-smarting competent investigators, and that same paradigm also applies to forensic efforts in IW environments.

The full enduring potential of DoD expeditionary forensic and biometric capabilities will be realized when enablers and assets are fully integrated across tactical IW lines of operations against violent extremist networks. At the operational level, this effort will require deliberate planning and generation of forensic annexes to operation orders and Theater Security Cooperation campaign plans. At the strategic level, partnerships and agreements must be negotiated to transition from U.S.-led combat

operations to bi- or multi-lateral security cooperation efforts across a broader range of military operations to include rule of law and combating trans-national organized crime.

Degradation or delay of forensic employment in target-rich environments may potentially jeopardize future partnerships through the lack of collection, exploitation, and prosecution opportunities. In the case of forensic and biometric enabled intelligence, the Combined Joint Force *got it right* in late-2003 and cannot afford to *get it wrong* now after forces have withdrawn from Iraq and plan to from Afghanistan in the near future. Synergizing tactical U.S. partnerships with host-nation evidence collectors, forensic specialists, intelligence officers, and Judge Advocates in a cooperative environment shaped by senior leaders will enable continued forensic support to national security.

End Notes

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[1] National Security Presidential Directive (NSPD) 59 and Homeland Security Presidential Directive (HSPD) 24 for *Biometrics for Identification and Screening to Enhance National Security* were issued on June 05, 2008 and DoD Directive 5205.15E to establish the *DoD Forensic Enterprise (DFE)* was issued on April 26, 2011.

[2] BIMA Annual Report FY10, pg 12.

[3] Joint Publication 2-01, *Joint and National Intelligence Support to Military Operations* defines Forensic-Enabled Intelligence (FEI) as the collection, scientific analysis, and exploitation of materials, weapons, equipment, output signals, or debris that link persons, places, and events to produce tactical and strategic intelligence in support of the Joint Force Commander and national decision makers. FEI includes, but is not limited to analysis of recorded and latent fingerprints, deoxyribonucleic acid (DNA), chemistry trace material, metallurgy, firearms and tool marks, facial and voice recognition, image and video analysis, and captured documents exploitation.

[4] Tom Dee. *The State of DoD Biometrics*. PPT presentation to Biometrics Consortium Conference, September 22, 2010.

[5] The Capstone Concept for Joint Operations, Version 2.0, released in August 2005 highlights *Transnational security threats* to include networked ideologues, criminals, or other hostile elements, and threats from *Failed or Failing States* that afford safe haven for terrorist or criminal enterprises.

[6] Major General Michael T. Flynn, USA, et al. *Fixing Intel: A Blueprint for Making Intelligence Relevant in Afghanistan*. Center for a New American Security, January 2010, pg 23.

[7] Historical DoD forensic capabilities can be found in the 2009 National Research Council of the National Academies (NRCNA) Forensic Science report on pg 11-1. The USACIL website also contains a brief history of expeditionary forensic science from 1943-1996, found at http://www.cid.army.mil/usacil2.html.
[8] Joint Publication 2-01, *Joint and National Intelligence Support to Military Operations*, January 05, 2012, expounds on JCMEC concept and capabilities.
[9] CJTF-7 Memorandum thru Commander JCMEC, *Iraqi Theater of Operations (ITO) Combined Explosive Exploitation Cell (CEXC)*. August 23, 2003. (on file with author)
[10] Stephen Phillips. *The Birth of the Combined Explosives Exploitation Cell (CEXC)*. Small Wars Journal, 2008, pg 2. Article provides a complete and thorough history of CEXC establishment.
[11] Ibid.
[12] Ibid.
[13] Ibid.
[14] CJTF-7 Memorandum thru Commander JCMEC, *Iraqi Theater of Operations (ITO) Combined Explosive Exploitation Cell (CEXC)*. August 23, 2003.
[15] Author read the Joint Manning Document while deployed to CEXC Iraq from July 2009 thorugh January 2010, but could not retrieve a copy.
[16] Interview with FBI SABT Nicholas Boshears on 10 February, 2012.
[17] CJTF 7 Interrogation Policy memo, found at http://cup.columbia.edu/media/3738/jaffer-blog.pdf on 28 February 2012.
[18] Information provided in email from Matthew Anderson (FBI TEDAC) on 21 March, 2012.
[19] Author experienced monthly averages of 30-50 monthly matches to known individuals while serving as CEXC Iraq Officer in Charge (OIC) from July 2009 thru January 2010.
[20] Joint Publication 2-01, *Joint and National Intelligence Support to Military Operations* defines Biometric-Enabled Intelligence (BEI) as the intelligence information associated with biometrics data that matches a specific person or unknown identity to a place, activity, device, component, or weapon that supports terrorist activity or insurgent networks. BEI can further support high-value individual targeting, confirm or refute claimed identity, and provide unclassified evidence to support warrant-based targeting and prosecutions of apprehended suspects.
[21] Information derived from author's experience while serving as CEXC Officer in Charge, July 2009 – January 2010, Baghdad Iraq.
[22] CEXC Iraq historical case-load information provided via email from Brian Kelley (NEODTD), 06 February 2012.
[23] Major Michael A Johnston, USA. *Expeditionary Forensics: The Warrior's Science Revealing the Hidden Enemy*. Military Police, 19-09-1, pg 5.
[24] Ibid.
[25] Concept of Operations (CONOPS) for Police Intelligence Operations (PIO) was published in March 2009, by the U.S. Army Military Police School (USAMPS). Project was sponsored by the Provost Marshal General of the Army and document is restricted to FOUO.
[26] Historical JPEC information obtained during interview with John Manson, Chief, Forensics Branch, Department of the Army Office of the Provost Marshal General, 25

January 2012. Additional FOUO information on JPEC establishment and operations can be found in a February 04, 2009 Marine Corps Center for Lessons Learned (MCCLL) report titled *Joint Prosecution and Exploitation Center Operations and the Use of Forensics in Iraq*.

[27] Ibid.

[28] Ibid.

[29] *USMC Identity Operations Strategy 2020* and complementary *Implementation Plan* are both restricted to FOUO.

[30] Department of Defense. *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense*. January 2012, pages 3 and 6.

[31] Department of Defense Directive 5205.15E. *DoD Forensic Enterprise (DFE).* April 26, 2011, pages 1 and 2.

[32] Information obtained during interview with John Manson, Chief, Forensics Branch, Department of the Army Office of the Provost Marshal General (OPMG), 25 January 2012.

[33]DoDD 5205.15E establishes policy and assigns responsibilities to develop and maintain an enduring, holistic, global forensic capability to support the full range of military operations.

[34] Tom Dee. *The State of DoD Biometrics*. PPT presentation to Biometrics Consortium Conference, September 22, 2010.

[35] Information provided by email from Christopher Dash (USACIL), 14 March 2012. USACIL has programmed for 3 separate EFL capabilities of approximately 40 specialists per EFL, with capabilities and capacity adaptable to the operating environment.

[36] Author experienced cooperative working relationship with JEFF 3 while serving as CEXC OIC, and WIT, CEXC, and JEFF assets at COB Speicher were co-located in a custom-designed and built compound for operational efficiency.

[37] Author recalls hand injury to U.S chemist in Afghanistan in 2009 and Canadian CEXC examiner in 2010 from improvised home-made explosive detonators. Author also has copy of the ATF Fire Inspector report for the fire and explosions that destroyed the CEXC Triage Laboratory on 06 September 2009.

[38] 2011 DoD Biometrics Collaboration Forum Event Report, pg 30.

[39] BIMA Annual Report FY10, pg 12.

[40] David Axe. *CSI Somalia: Interpol Targets Pirates*. 18 June 2009.

[41] Forensic Project Iraq, Report for October 2009, pg 6.

[42] Ibid.

[43] Forensic Project Iraq, Report for November 2009.

[44] Author was involved in establishment of TF TROY Combined Joint Explosive Triage (CJET) training to Iraqi Security Forces in support of larger U.K. and ATF Explosive eXploitation Iraqi Transition (EXIT) program.

[45] Forensic Project Iraq, Report for October 2009. Despite the availability of funds from the U.S. International Training and Assistance Mission (ITAM), domestic bureaucracy hindered construction and completion of planned secondary laboratories in Ramadi, Najaf, Al Kut, and Kirkuk. Sufficient qualified personnel and facility management, to include maintenance and calibration of laboratory equipment at the existing laboratories remain problematic.

[46] Forensic Project Iraq, Report for October 2009, pg 6.
[47] Information derived from author's experience while serving as CEXC Officer in Charge, July 2009 – January 2010, Baghdad Iraq.
[48] http://www.aljazeera.com/news/middleeast/2012/01/2012155465176859.html, and http://www.cbsnews.com/8301-501713_162-57381008/20-people-killed-in-iraqi-police-academy-blast/ , accessed on 13 March 2012. (on file with author)
[49] Information obtained in email from John Manson, 26 January 2012.
[50] "Collection" in this context refers broadly to both Biometric Enrollments and Evidence collection, but due to space restrictions, this paper restricts discussion to evidence collection in support of FEI and BEI.
[51] MNF-I Public Affairs release No 20080610-09, June 10 2008. (on file with author)
[52] Kimberly Dozier, *Spec-Ops troops study to be part-spy and part gum-shoe*. Associated Press, January 04, 2012.
[53] Ibid.
[54] Pamela M. Collins, *Forensics: From Its Esoteric History to the Streets of Baghdad*. Additional references available, although not used for this paper due to FOUO restrictions, include Center for Army Lessons Learned (CALL) Newsletter No. 10-35 (*Forensics and Warrant-Based Targeting*) in March 2010, and Handbook No. 11-25 (*Commanders Guide to Biometrics in Afghanistan*) in April 2011
[55] Matthew Hickman, *BJS Census of Publicly Funded Forensic Crime Laboratories*, NCJ 205988, September 2004.
[56] DoS Country Reports on Terrorism 2010, pages 249-251.
[57] Recidivist statistics from Guantanamo Detainee releases obtained from March 2012 DNI report to Congress available at http://www.dni.gov/reports/March%202012%20Summary%20of%20Reengagement.pdf .
[58] CAPT Frederick Gaghan, USN. *Attacking the IED Network*. PPT presentation to NDIA Global EOD Conference, 05 May 2011.
[59] Katharine Houreld. *Bancroft Global Development, U.S. Group Advises African Troops in Somalia*. Associated Press, January 21, 2012.
[60] Jason Straziuso. *African AQ-linked groups using advanced IEDs*. The Associated Press, March 15, 2012.
[61] Ibid.
[62] MAJ Stuart Farris, *A Monograph: Joint Special Operations Task Force – Philippines*, pages 31, 38-39
[63] Ibid, pg iv.
[64] 2011 DoD Biometrics Collaboration Forum Event Report, pg. 19.
[65] Information provided in email from Christopher Dash on 14 March 2012.
[66] Dr. Bianka Adams. *Command Report, Multi-National Division Baghdad, 1st U.S. Cavalry Division*. Period covered February 10, 2009 – January 13, 2010. Report published March 29, 2010.
[67] Ibid, page 9.
[68] BIMA Annual Report FY10, pg 12.
[69] John Cushman. *U.S. Says IED parts smuggled to Iran*. The New York Times, October 25, 2011.

[70] Federal Bureau of Investigation (FBI). *Two Iraqi Nationals Indicted on Federal Terrorism Charges in Kentucky*. U.S. Department of Justice, Office of Public Affairs, May 31 2011.
[71] Information provided in email from Christopher Dash (USACIL) on 14 March 2012.
[72] MAJ Steve D. Berlin, JAGC, USA. *Conviction-Focused Targeting: Targeting Violent Extremists While Developing Rule of Law Capacity*. Small Wars Journal, August 24, 2010.
[73] Capt. Aimee Jaskot. *CSI: INSCOM*. INSCOM Journal, Spring 2008.
[74] Information from author's experience at CEXC Iraq in July 2009 thru January 2010.
[75] National Research Council of the National Academies (NRCNA). *Strengthening Forensic Science in the United States: A Path Forward*. Washington DC, National Academies Press, 2009, pages 18-27 and 272-283.
[76] Information obtained during interview with John Manson, Chief, Forensics Branch, Department of the Army OPMG, 25 January 2012.
[77] Ibid, and confirmed in *The State of DoD Biometrics* PPT presentation by Mr. Tom Dee to Biometrics Consortium Conference, September 22, 2010.
[78] Information based on author's experience at CEXC Iraq in July 2009 thru 2010. Specific events and counter-measures not discussed for operational security to protect sources and methods.

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